



FRD ACTIVITIES REPORT

May 2005



Research Programs

Urban Dispersion Program (New York City Study)

Planning and preparing for the UDP atmospheric tracer study in New York City, scheduled for August) continues. Kirk Clawson attended the NYC OEM meeting on May 12 in which all interested NYC and NJ government agencies were briefed on the August experiment. Contacts within the NYC Office of Emergency Management (OEM) were formed to ensure successful project execution. The OEM is the local coordinating agency for all UDP field efforts. Arrangements were also made to conduct a background SF₆ study in Midtown during the month of June. This will determine what affect, if any, the local fugitive SF₆ sources have on the detection of intentionally released SF₆. Each of the six background monitoring sites in Midtown were visited and documented to determine the governing agencies. All internal FRD preparations were completed for the study and permissions were obtained to install the samplers on light poles at each of the sampling sites. (Kirk Clawson and staff, 208-526-2742)

ET Probe

Much of the recent activity for the ET probe has been related to future planning. NOAA is now planning budgets for fiscal years 2008-12, and an attempt is being made to integrate the ET probe research into the Science, Technology, and Infusion program. This effort is being closely coordinated with the BAT probe effort led by Dr. Jeff French at ATDD. Part of the proposed effort would be the development of improved BAT and ET probes that are based on compact PC/104 embedded computer modules. To avoid redundant efforts, the improved BAT and ET probes would share as much hardware and software as possible. The ultimate goal of the ET probe effort would be the deployment of the probes on NOAA operational platforms, such as the C-MAN stations along the coast and the network of moored buoys operated by NOAA. Probes on moored buoys would require additional sensors to detect platform motion, but such sensors are already available from the BAT-probe development. (Richard Eckman, 208-526-2740)

Smart Balloon

Four bladders and remaining balloon shells have been received. All four of the bladders have been tested by inflating each one with air to a diameter of 11 feet. The diameter is monitored closely with a survey transit and the temperature is tracked over a one day test. If the diameter of the balloon decreased by more than a quarter of an inch, while the room temperature remains constant, the bladder has a leak of more than just the typical diffusion loss through the bladder's urethane film wall. One bladder has failed the test and been sent back to the manufacturer for repair. One of the shells and three of the bladders are being prepared for flight testing. Two of the bladders will be inside the shell and one will be on the outside to act as a rain jacket. This

will be our first test using a bladder placed on the outside of a balloon for rain protection. (Randy Johnson, 208-526-2129)

Programmable Integrated Gas Sampler (PIGS) Upgrade

A series of 14 tests on the Programmable Integrating Gas Samplers (PIGS) were completed this month. One purpose of the tests was to check the operation of the firmware upgrades in the PIGS and software changes on the Automated Tracer Gas Analysis System (ATGAS). The other purpose was to check the operation of samplers in the presence of high concentrations of SF₆ so we could better understand some problems observed in recent field projects. The test results showed that the air pumps used in the samplers have small leaks that allow blanks and background samples taken after the sampler has been exposed to high levels of SF₆ to be contaminated. However, a change to the cartridge cleaning procedure can minimize the problem so that it is significant only if the SF₆ concentrations are greater than 20,000 ppt. The tests also showed that samplers should be allowed to sit for a couple hours before re-use to ensure that the next set of samples are not contaminated by residual SF₆ in the sampler. (Roger Carter 208-526-2745, Debbie Lacroix)

Development of Perfluorocarbon Tracer Detection Capability

The perfluorocarbon standards were ordered this month to continue the perfluorocarbon tracer detection development work. Ten cylinders of a combination of perfluorodimethylcyclobutane (PDCB), m-perfluorodimethylcyclohexane (m-PDCH) and perfluoromethylcyclohexane (PMCH) were ordered in concentration ranges from 100 ppt to 100,000 ppt. It will take at least 8 weeks for the vendor to prepare and certify these standards. (Debbie Lacroix 208-526-9997)

Cooperative Research with DOE NE-ID (Idaho National Laboratory)

INL Climatology

The revision of the INL Climatology proceeded rapidly this month. Nearly all of the revised sections were received from the editor for additional internal review. These sections were reviewed by appropriate FRD staff and returned for additional work. It is anticipated that the next draft will be the final opportunity to make comments before it is published. (Kirk Clawson and staff, 208-526-2742)

INL Drills, Exercises, and Emergencies

On 8 May, Team A conducted a drill at the EOC. The drill involved a vehicle accident between a 12-passenger van and flat bed truck. The truck was carrying a radioactive material that spilled onto the roadway injuring a number of passengers. The drill went smoothly as the FRD team ran the MDIFF dispersion model and provided meteorological support to the emergency director. (Jason Rich 208-356-9108, Brad Reese)

Mesoscale Modeling

The MM5 configuration at FRD has been highly reliable over the past several months. The system begins with a cold start at 0300 UTC each day, and then restarts every three hours thereafter. Each restart assimilates another three hours of Mesonet data into the model simulations. Little manual intervention is required, since all the tasks required to generate the MM5 simulations are handled through automated scripts. (Richard Eckman, 208-526-2740)

Transport and Dispersion Modeling

Currently, the MDIFF dispersion model produces radiological dose estimates only for a fixed set of release scenarios at INL facilities. For each of these “canned” scenarios, MDIFF uses a specific dose conversion factor that accounts for the known radiological inventories at the facilities. One problem with this approach is that there is no obvious way to deal with situations that do not match up with any of the canned scenarios. A transportation accident is one example. This problem has been discussed with the INL contractors, and it was decided that the simplest solution is to fold a dose conversion factor into the source term that is given to MDIFF. This approach has some limitations, but it is suitable for screening simulations when the release is dominated by a single radionuclide. (Richard Eckman, 208-526-2740)

Other Activities

Papers

Clawson, K.L., R.G. Carter, D.J. Lacroix, C.A. Biloft, N.F. Hukari, R.C. Johnson, J.D. Rich, S.A. Beard, T. Strong. 2005. Joint Urban 2003 (JU03) SF₆ Atmospheric Tracer Field Tests. NOAA Technical Memorandum OAR ARL-254, Air Resources Laboratory, Idaho Falls, Idaho, 237 pp.

Safety

The video, “Identity Theft: How to Protect Your Money, Your Credit, and Your Good Name” was shown at the monthly staff meeting. (Debbie Lacroix, 208-526-9997)

Travel

On May 9-11, Kirk Clawson traveled to Silver Spring, MD to attend the OFCM Research Meeting.

On May 11-13, Kirk Clawson traveled to New York City to attend a planning meeting for the Urban Dispersion Program.

Training

On May 9, Paula Fee completed the INL online training, Field Worker Point of Contact (FWPC). This training outlines the FWPC responsibilities if there is an emergency situation on the INL site.